EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Robert Buyan on 18 June 2008.

2. The application has been amended as follows:

1. (Currently Amended) A vibration detector and transducer, comprising:

a light source for emitting light signals;

a light detector for receiving light signals emitted from the optical source and converting the received light signals to electrical signals; ~~and~~

an array of optical waveguide resonators positioned between the light source and the light detector, each resonator being positioned to receive vibration waves and each resonator having a different resonant frequency such that each resonator will modulate the intensity of the light passing between the optical source and the light detector in response to the vibrations received by the resonator; and

an acoustic housing surrounding the light source, the light detector, and the optical waveguide resonators, the housing being configured to isolate ambient vibrations from airborne vibrations.

Please cancel claim 13.

14. (Currently Amended) An apparatus for enhancing hearing in a human or veterinary patient, said apparatus comprising:

a light source for emitting light signals;

a light detector for receiving light signals emitted from the optical source and converting the received light signals to electrical signals;

an array of optical waveguide resonators positioned between the light source and the light detector, each resonator being positioned to receive sound and each resonator having a different resonant frequency such that each resonator will modulate the intensity of the light

passing between the optical source and the light detector in relation to the sound received by the resonator;

a housing encasing at least one of the light source, the light detector and the array of optical waveguide resonators, the housing being configured to be worn on or in the body of the patient wherein the housing is configured to isolate ambient vibrations from airborne sound.

Please cancel claim 23.

25. (Currently Amended) A method of detecting vibrations and converting the vibrations into electrical signals, the method comprising:

providing a plurality of optical waveguide resonators, each having a different resonant frequency and being surrounded by a housing configured to isolate ambient vibrations from airborne vibrations;

causing the optical waveguide resonators to receive an incoming vibration wave;

directing light through the resonators, such that the light is modulated by vibration of at least one of the resonators;

receiving the modulated light; and

converting the modulated light into electrical signals.

42. (Currently Amended) A method of making a hearing enhancement device, comprising the steps of:

providing an LED array, a photodiode array, and an optical waveguide resonator array, the resonator array being configured to receive sound from an external source and being positioned between the LED array and the photodiode array so as to modulate light transmitted from the LED array and the photodiode array in response to the received sound; and

packaging the arrays in a housing configured to be worn in or on the body of a patient by encasing the arrays in an acoustic housing configured to isolate ambient vibrations from airborne sound.

Please cancel claim 45.

3. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach and/or suggest a vibration detector and transducer, comprising: a light source for emitting light signals; a light detector for receiving light signals emitted from the optical source and converting the received light signals to electrical signals; an array of optical waveguide resonators positioned between the light source and the light detector, each resonator being positioned to receive vibration waves and each resonator having a different resonant frequency such that each resonator will modulate the intensity of the light passing between the optical source and the light detector in response to the vibrations received by the resonator; and especially including an acoustic housing surrounding the light source, the light detector, and the optical waveguide resonators, the housing being configured to isolate ambient vibrations from airborne vibrations.

The prior art of record fails to teach and/or suggest a method of detecting vibrations and converting the vibrations into electrical signals, the method comprising: providing a plurality of optical waveguide resonators, each having a different resonant frequency and being surrounded by a housing configured to isolate ambient vibrations from airborne vibrations; causing the optical waveguide resonators to receive an incoming vibration wave; directing light through the resonators, such that the light is modulated by vibration of at least one of the resonators; receiving the modulated light; and converting the modulated light into electrical signals.

The prior art of record fails to teach and/or suggest a method for treating hearing loss or impairment in a human or veterinary patient, the method comprising the steps of: providing a hearing enhancement device including a light source for emitting light signals; a light detector for receiving light signals emitted from the optical source and converting the received light signals to electrical signals; and an array of optical waveguide resonators positioned between the light source and the light detector, each resonator being positioned to receive sounds and each resonator having a different resonant frequency such that each resonator will modulate the intensity of the light passing between the optical source and the light detector in response to the sounds received by the resonator; and especially providing an interface between the hearing enhancement device and the inner ear of the patient.

The prior art of record fails to teach and/or suggest a method of making a hearing enhancement device, comprising the steps of: providing an LED array, a photodiode array, and an optical waveguide resonator array, the resonator array being configured to receive sound from an external source and being positioned between the LED array and the photodiode array

so as to modulate light transmitted from the LED array and the photodiode array in response to the received sound; and packaging the arrays in a housing configured to be worn in or on the body of a patient by encasing the arrays in an acoustic housing configured to isolate ambient vibrations from airborne sound.

The closest prior art is that of **Hawkins (US 3,213,197)**, **Hawkins (US 3,332,757)**, and **Hawkins et al. (US 3,333,278)** which teach the use of optical fibers as vibrational resonators to receive vibrations, specifically acoustic or sound vibrations, at specific frequencies. The fibers are configured to different resonances through their lengths and shapes. What the prior art doesn't teach is the housing surrounding the optical fibers being configured to isolate ambient vibrations from airborne sound or for the output of the optical fiber vibrational transducer be fed to an interface between a hearing enhancement device and the inner ear of a patient.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. The Examiner notes that Applicant has elected to accept the above Examiner's Amendment without prejudice in order to further the prosecution of the present application and that Applicant reserves the right to pursue the claims amended above as they were originally filed in a continuing application.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hawkins (US 3,213,197) discloses a frequency responsive apparatus utilizing fiber optic cables as vibration sensors.

Hawkins (US 3,332,757) discloses a method of making a fiber optic frequency responsive device.

Hawkins et al. (US 3,333,278) discloses a method of making a frequency responsive device utilizing fiber optic frequency sensors.

Prestel (US 4,538,140) discloses a fiber optic acoustic transducer intrusion detection system.

Culshaw (WO 86/05271) discloses an optical measuring device which senses physical variables by measuring the resonant frequency of a vibratable structure.

Phillips (US 4,678,905) discloses optical sensors for detecting physical parameters utilizing vibrating piezoelectric elements.

NA9006371 (IBM Technical Disclosure Bulletin) discloses an optical microphone utilizing a cantilever beam array forming part of a Fabry-Perot resonator.

Farah (US 5,891,747) discloses an interferometric fiber optic displacement sensor.

Vujanic et al. (US 6,491,644 B1) discloses an implantable sound receptor for hearing aids.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSE M. MILLER whose telephone number is (571)272-2199. The examiner can normally be reached on Monday - Friday, 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RMM/
19 June 2008
/Hezron Williams/
Supervisory Patent Examiner, Art Unit 2856